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**Vol. 10 (2): 235-248 (2020)**

## **GEOSPATIAL ANALYSIS OF THE DISTRIBUTION OF AIR POLLUTANT EMISSIONS IN TEHRAN WITH A FOCUS ON ENVIRONMENTAL JUSTICE**

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### **ABSTRACT**

Despite its environmental and social benefits, urban development has also led to severe problems such as air pollution, especially in megacities with escalating population growth like Tehran, the capital of Iran. This study aims to analyze the spatial correlation between air pollutants' emission and the socioeconomic status of urban districts, with an emphasis on environmental justice, in order to make a contribution to the quantitative analysis of environmental inequalities in Tehran. Thus, a quantitative spatial analysis was carried out by a geographically weighted regression model in order to compare the relationship between the emission of air pollutants from mobile and stationary sources in selected urban districts and the socioeconomic status of these districts. The results showed that, of all the 22 districts of Tehran, district 3 had the highest and district 18 the lowest rank in terms of socioeconomic status. It was concluded that districts with better socioeconomic statuses emit more pollutants, while they are less exposed to the subsequent risks, which implies environmental injustice in the study area.

**Key words:** Urban Equity, Environmental inequality, Air pollution, Geographically Weighted Regression, Socioeconomic status.

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## **CHEMICAL ANALYSIS OF THERMO MINERAL WATERS IN PEJË BATHS**

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### **ABSTRACT**

In order to evaluate the possible exploitation of thermal mineral water of Peja baths, for the health needs of the population, in the rehabilitation center, which was built near these waters, so far no appropriate scientific research is taken to evaluate them. The conceptual, professional, scientific and functional solution in this regard will results in the search for a new location destined for the next projections additional pools. This should be done in order to enable the population to use this natural wealth, for health and their commercial needs. Further research is planned to be conducted for the physico-chemical characterization, which will follow up on time to time the changes in the composition of the various components of this water. The analysis of the thermos-mineral water in this work involved the determination of several physico-chemical parameters (COD, BOD, conductivity, pH value, etc.) and some heavy metals (Cu, Mn, Fe, Pb, Cd, Zn, etc).

**Keywords:** Pejë Baths; thermo mineral water; heavy metals, physical-chemical parameters.

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## **MODERN STRUCTURAL-DYNAMIC ORGANISATION OF PHYTOCOENOSES AT POST-AGRICULTURAL LANDSCAPES IN SOUTH-WESTERN TRANS-BAIKAL (ILLUSTRATED BY KEY SITES, THE SELENGA RIVER BASIN)**

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### **ABSTRACT**

Studies of the peculiarities of vegetation structure on post-agricultural landscapes in central part of the Selenga R. basin (South-Western Trans-Baikal) revealed modern trends of phytocoenoses formation during last decades since the land stopped being used for cereals agriculture and pasturage. We have to state while characterizing the peculiarities of vegetation transformation in the Selenga R. Basin that land use in this region under the conditions of relatively drought periods during different years resulted in evident elevated anthropogenic degradation of soil and vegetation cover. As the Selenga R. Basin is situated within very important biogeographic boundaries, namely within boundaries between regions and provinces of southern boreal forests and zonal dry bunchgrass steppes of Central Asian type, where zonal forest-steppe is formed with its transition into zonal steppe, the processes of environment decay are better expressed.

**Keywords:** vegetation structure, post-agricultural landscapes, biogeographic boundaries, zonal steppe and forest-steppe, basin of Selenga river, Trans-Baikal.

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## **COMPARISON BETWEEN CYTOLOGY AND HISTOPATHOLOGY TO EVALUATE ENDOMETRITIS IN DAIRY COWS**

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### **ABSTRACT**

This study aims first at evaluating the concordance between both cytological and histological results, and at assessing the homogeneity of inflammation in the cytological and histological samples within the genital tract. Cytology is currently the standard technique for the diagnosis of the endometritis in postpartum cow based on a sample that is taken by a sterile cytobrush or a swab in the uterine body. However, cytology evaluates only the condition of the mucosa, for more, at a single site of the genital tract. An ex vivo study was implemented on 30 uteri collected from a slaughterhouse in Tiaret center. The researcher took two samples from 4 different sites of the uterus – cervix, uterine body, right horn and left horn- one for cytological examination and one for the histological. It has been identified that there is a poor match between cytology and histology ( $P = 0.02$ ) noting that the epithelium- often absent in the blades- was not taken into consideration. Besides, according to of the research findings, the inter-site homogeneity of cytological and histological specimens was not present, which can distort or underestimate the inflammatory state of the uterus. Also, the cervix can show inflammation without being an inflammation of other sites and vice versa. In addition, the Neutrophil levels of both horns and uterine body were in good concordance for cytology test. In conclusion, cytological examination is still the easiest to achieve, but it may underestimate the degree of uterine inflammation; whereas, uterine biopsy provides more results, but its practice is very difficult to perform.

**Keywords:** Cytology, Histology, Neutrophil, Diagnosis, Endometritis, Cow.

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## **DETECTION OF *CRYPTOSPORIDIUM* spp. IN CALVES THROUGH NESTED PCR AND KINYOUN'S ACID-FAST METHODS IN VAN, TURKEY**

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### **ABSTRACT**

Cryptosporidium is a protozoon of zoonotic importance causing infections with diarrhoea and other clinical symptoms in man, domestic, and wild animals. The present study was conducted to determine the prevalence of cryptosporidiosis in diarrhoeic calves which were up to 1 month old in Van, Turkey, using Kinyoun's acid-fast and Nested PCR methods. In this study A total of 164 diarrhoeic calves faecal samples were collected from diarrheic calves at different farms located in Van, Turkey during January 2019 to September 2019. The faecal samples stained with Kinyoun's acid-fast method then examined with microscope. DNAs were extracted from all the faecal samples using RTA stool DNA isolation kit. In order to amplify the SSU rRNA gene region of the DNAs, appropriate primers were used in the Nested PCR. According to the results, In the microscopic examination, *Cryptosporidium* spp. oocyst were identified in 61 out of 164 diarrhoeic calves faecal samples (37.19%). *Cryptosporidium* spp. specific bands of 826-864 bp in size were obtained from 72 out of 164 diarrhoeic calves faecal samples (43.9%). To the best of our knowledge, no other previous study is available with concern to molecular investigation of the prevalence of Cryptosporidium in calves around Van, Turkey. With this study, it was revealed that cryptosporidiosis is an important agent in calf diarrhoea, and measures should be taken in this regard.

**Keywords:** *Cryptosporidium* spp., Nested PCR, Turkey

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## **SOIL MICROBIOME: DIVERSITY, ACTIVITY, FUNCTIONAL AND STRUCTURAL SUCCESSIONS**

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### **ABSTRACT**

The article presents original results of research. The aim of this study was long term investigation of soil microbiome in primeval forest ecosystems, namely the structure of microbial communities, the number of major ecological-functional groups, functional parameters such as: enzymatic activity of the soil by the level of catalase and invertase. To analyze impact of endogenous and exogenous factors on soil microbial community and succession processes. Estimate biodiversity of soil microbiome by Shannon index in different edaphotopes of primeval forest ecosystems. Microbiological studies of soil were carried out according to generally accepted methods in soil microbiology. Enzymatic activity of the soil: catalase – was determined by gasometric method and invertase - by colorimetric method. Statistical analyses were performed by using Statistica 10 software. Basic descriptive statistics was calculated, that is, the arithmetic mean and standard deviation. The influence of endogenous and exogenous factors in primeval forest ecosystems of Shyrokoluzhansky massif of the Carpathian Biosphere Reserve caused changes in microbial community. For ten years changed diversity and functional activity of soil microbiome. Based on long-term studies of changes in soil microbial communities of natural ecosystems, a succession concept of soil microbiome has been proposed.

**Keywords:** ecosystem, succession, soil, diversity, microbiome, enzyme activity.

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## **MOLECULAR CHARACTERIZATION OF TETRATRICHOMONAS GALLINARUM IN DOMESTIC TURKEYS (*MELEAGRIS GALLOPAVO*) IN VAN PROVINCE, TURKEY**

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### **ABSTRACT**

*Tetrahymenopsis gallinarum* is a protozoan parasite of various galliform birds causing a type of enterohepatitis termed tetrahymeniasis. During the year 2018-2019 an outbreak of unspecified granulomatous diseases, characterized by the sudden deaths of young turkeys were observed in 18 turkey farms in the Van province of Turkey. Three hundred eighty fecal samples were obtained from the infected farms and 42 tissue samples (liver and caecum) collected from the dead turkeys were examined under light microscope and through molecular characterization. The necropsies of dead turkeys revealed granulomatous necrotic foci in the caecum and liver. A number of 125 (32.89%) fecal samples and all of the 42 (100%) tissue samples were found positive for *T. gallinarum* by molecular characterization. The sequence analysis for both fecal and tissue samples were confirmed with *T. gallinarum* (MH935510) those showed 97.9% similarity on the ‘Basic Local Alignment Search Tool’. This is the first molecular characterization report of *T. gallinarum* in Turkey.

**Keywords:** *Tetrahymenopsis gallinarum*, Molecular characterization, Turkey

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## **THE PRESENCE OF GREEN TURTLE (*CHELONIA MYDAS*) IN ALBANIA**

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### **ABSTRACT**

Information about the loggerhead turtle in Adriatic is highly present compared to the green turtle. The bycatch of the green turtle (*Chelonia mydas*) in Albania was monitored during the period 2011-2018. Results indicate the annual presence of juveniles and sub-adult turtles in Albania, with a greater encounter in Drini bay. The Drini bay, and possibly Vlora bay, might be nursery habitats for the turtles dispersed to the South Adriatic from the Eastern Mediterranean nesting sites. The presence of both juvenile and sub-adult greens suggests a possible role as oceanic and neritic areas for both of these bays, especially for Drini bay. Results indicate Drini bay Stavniks as the fishing gear with the highest green turtle bycatch, and their seasonal and geographical limited usage might impact the low number of encounters in other areas.

**Key words:** *Chelonia mydas*, Green turtle, Albania, Nursery habitat, Oceanic habitat, Neritic habitat.

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**Vol. 10 (2): 301-304 (2020)**

## **PSYCHOLOGICAL INTERVENTION IMPACT IN PATIENTS UNDERGOING DIALYSIS' MENTAL HEALTH - CASE STUDY**

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### **ABSTRACT**

Chronic kidney disease includes conditions that damage the kidneys and decrease patients' ability to keep healthy. In many cases those patients remains the choc of their life, a trauma. Their quality of life will never be the same and it is difficult for them to invest in other interests. They are often unsatisfied, angry, fatalists and depressive. The aim of the psychology unit was to help them to invest again desires and wishes, in order to increase their quality of life. Helping them to connect their thoughts, emotions and behaviors would bring them in a new psychosomatic state and help them to improve the quality of life. Case presentation: A 36-years old man is undergoing dialysis in Hygeia Hospital. For the first time he was admitted on 2004, stayed for one year and a half in dialysis and went through the transplant. He returned in 2018. Because of his young age and the return after the transplant, it was very difficult for him to cope and accept the disease. He had difficulties to express his anger, worries. CORE-OM test, a psychological instrument that is validated in Albania and evaluate the overall mental wellbeing was passed. The scale of Problems/psychological problems resulted symptomatic our hypothesis was that there is always a possibility for the psychologist to intervene with patients with chronic kidney disease, because psychic organizations are in constant evolution. The psychological intervention helped him to increase quality of life, get back to a normal life, and extend his interests and social network.

**Key words:** quality of life, hemodialysis, depression, psychological intervention

**Vol. 10 (2): 305-316 (2020)**

## **LIFE-CYCLE ANALYSIS AND TECHNOECONOMIC MODELING OF AN ENERGY GENERATION SYSTEM**

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### **ABSTRACT**

Biomass is considered as a renewable energy source with increasing popularity because of its energy production and greenhouse gas (GHG) reduction potentials. The heat and electricity are produced with burned gasification products, otherwise the products are treated by synthesis of liquid transport fuels. Biomass gasification is a flexible, efficient, and environmentally acceptable process to meet the future energy demand. In this study, a life cycle analysis (LCA) approach is used to determine the environmental performance of an energy generation plant that is using synthesis gases derived from biomasses. Hence, a life cycle analysis of an Organic Rankine Cycle (ORC) power plant being able to produce 955 kW electrical, 5415 kW thermal power with 15% net electrical efficiency of biomass was carried out. The probability distribution of the daily inventory demand was examined and modeled using historical outcomes of last 200 days, and the results were analyzed. The findings are remarkable to note that the average demand of 1480 kg biomass in the 10-day simulation varies slightly after the daily projected biomass demand of 1402.5 kg calculated. The result of gasification and electrical energy production is waste heat and is used for drying waste biomass in the plant for the heat demands of other units.

**Keywords:** Biomass gasification; Life-cycle Analysis; Cogeneration; Power generation; Monte Carlo simulation

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## **THE APPLICATION OF LASER DIFFRACTION ANALYSIS FOR GRAIN SIZE DETERMINATION OF CURRENT DEPOSITS OF VJOSA RIVER DELTA LITTORAL (ALBANIA)**

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### **ABSTRACT**

Vjosa River sources from Pindus Mountains in Greece, with a length of 272 km and drains in the southern of Albania. The surface of Vjosa river drainage basin is 6700 km<sup>2</sup>. The surface of the river delta is 317 km<sup>2</sup>, and stretches from Hoxhara channel in the north to the Zvérnec molasses hills in the south. The study area is characterized by sandy banks, mud flats, salt marshes, small lagoons, and temporary marshes. This delta presents a coastal area up to 12.6 km toward the south and 9.5 km in the north. For the analysis of the grain size distribution and sediment parameters such as mean, standard deviation or sorting, skewness and kurtosis of Vjosa river delta a Laser diffraction Analysis was applied. The measurements were performed using a Malvern instrument while the data processing was carried out by Mastersizer 2000 software. The bivariate analysis, linear discriminant functions (LDF), passegia diagrams (CM plots) were used for 50 samples, in order to study the depositional processes, hydrodynamic conditions, mechanism of sedimentation and depositional environments. The results show that samples of the Vjosa river delta consist of fine to medium sand, well sorted, near symmetrical, mesokurtic to very leptokurtic. The linear discriminant functions analysis indicates that sediments were reworked by Aeolian and Beach processes under the environment of shallow marine and fluvial deposits. Results of passage diagrams (CM plot) reveal that sediments were deposited by bottom suspension and rolling-PQ and less graded suspension-QR, as well as rivers and by tractive currents.

**Keywords:** Bivariate plots, Grain size distribution, Linear discriminant functions, Passegia diagrams, Vjosa River Delta

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## **PROCESS OF THE SELECTION OF SORGHUM-SUDANK HYBRIDS IN ARID CONDITIONS STEPPE ZONE**

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### **ABSTRACT**

Aim of the research is to study the parameters of yield and investigate the quality of green mass, also what is of great importance is determining of the level of true heterosis of the main quantitative traits in new sorghum-sudank hybrids created on a great sterile basis at the North Caucasus Federal Agricultural Research Center. The parental forms of the new hybrids are characterized by high combining ability, a rather great and very significant level of the true heterosis, which makes it possible to obtain hybrids with a high rate of initial growth and post-abortion growth, which have high drought tolerance and give stable green mass yields in the various soil and climatic conditions. The best of them may possess a short sprouting period that includes the appearance of good brooms, which at the Gvardeets was 50 days, Boyarin - 56 days. During mowing periods in these hybrids, in comparison with the average values of the parental forms, the duration of the vegetation period did not extend too much. The Fakel hybrid had a similar period of 65 days. Plant height may also depend on genotypes and is inherited with a high degree of heterosis. On the 30th day of the vegetation, the maximum plant height (82.0-86.5 cm) was obtained from hybrids Gvardeets, Boyarin, Oda and the standard Navigator. In 2018-2019 in total, for two mowing, the highest yield of green and dry mass was obtained from new sorghum-Sudan hybrids Boyarin (51.18 t/ha and 11.44 t/ha respectively), Fakel (51.42 t/ha and 11.45 t/ha), as well as the Gvardeets (47.53 t/ha and 11.03 t/ha). These combinations also exceeded the green mass of the Navigator standard by 5.94 t/ha; 6.18 t/ha and 2.29 t/ha. The level of the true heterosis of the green mass in comparison with the averaged values of the parent forms was marked by 22.6 t/ha (78.5%) for the Fakel hybrid, 16.69 t/ha (48.4%) for Boyarin and 11.80 t/ha (33.1%) of the Gvardeets. Hybrids Gvardeets and Boyarin provided the normal and at the same time the highest content of crude protein (10.38-10.54%) in absolutely dry matter. The new sorghum-Sudanese hybrid Gvardeets (Zersta 90C x Sputnitsa) was submitted to the state variety test from 2018. Hybrid Boyarin (A-63 x Sputnitsa) is preparing to transfer to some variety testing according to some value facts.

**Key words:** sorghum-sudank hybrid, selection, heterosis level, productivity, green mass.

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## **EFFECT OF GARLIC POWDER ON GROWTH PERFORMANCE AND BLOOD METABOLITES IN MALE LAMBS**

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### **ABSTRACT**

This study was conducted to evaluate the effect of different levels of garlic powder (GP) on growth performance and blood metabolites of male lambs. Twenty male lambs of Dalagh breed with 6 months of age and mean initial body weight of  $31.5 \pm 2.5$  kg in a 91-days (7 days for adaptation and 84 days trial) were assigned randomly to four dietary treatments with five replicates per treatment in a completely randomized design. Treatment were include: control (without GP), 5, 10 and 15 gr GP/lamb/day. The lambs were fed individually ad libitum. The blood samples were collected in weeks 0, 4, 8, 12 and lambs were weighed every two weeks. Dry matter intake (DMI) was determined every two weeks. The results of these experiments showed that dry matter intake of lambs fed with 15 grams GP per day increased compared with control. Adding GP had no significant effect on the average daily gain (ADG) and feed conversion ratio (FCR). The GP had no effect on serum blood glucose, urea and triglyceride concentration, but treatment with high garlic powder decreased blood urea and triglyceride numerically. In conclusion, the results of these experiments showed that dry matter intake of lambs fed with 15 grams GP per day increased compared with control, but they had no change in fattening performance and blood metabolites of male Dalagh lambs.

**Key words:** Lambs, garlic powder, growth performance, blood metabolites

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## **SOIL COVER SPATIAL HETEROGENEITY IN AGRICULTURAL FIELDS OF FOREST-STEPPE ZONE**

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### **ABSTRACT**

The article considers the phenomenon of soil cover spatial heterogeneity and its influence on the lands productivity of the Right-Bank Forest-Steppe of Ukraine. The basic patterns of existence and functioning of micro-depressions (potholes) on chernozem soils, directly on the agricultural fields of the research farm «Velikosnitinske» in Kiev region are determined. It has been found that one of the most important reasons of vegetation and crop yields variegation of the experimental farm field crop rotations is that microrelief elements of various shapes and depths are common here. The main factor affecting soils and vegetation is the water regime of such micro-depressions, which differs significantly from the water regime of lowland territories. Depending on the redistribution of atmospheric moisture over the topography of the field, the agroecological condition, properties and biological activity of the soil, the physiological state of the plants vary changing indicators of the size and quality of the crop. UAV (drones), GPS-receiver and satellite images Landsat-8 and Sentinel-2, internet weather service rp5 were the instruments for studying the dynamics of the water regime of micro-depressions and the state of vegetation. It was determined that the uneven distribution of moisture in agrolandscapes leads to the formation of various soil differences and has a significant effect on crop formation and the duration of the growing season of crops. Research results can be used in precision farming and in compiling detailed soil maps. It is proposed to use the identified patterns in the development of technologies for growing crops under conditions of spatial heterogeneity of the water regime of soils.

**Key words:** soil, water regime, spatial heterogeneity, productivity, remote sensing, agroecological state.

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## **BIOREMEDIATION OF HEAVY METALS FROM ENVIRONMENT BY BACTERIA**

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### **ABSTRACT**

The increasing progress of industries in the last decade has been the most important cause of environmental pollution, and the polluted wastewater from various industries is causing large amounts of heavy metals to enter the environment. The global level of environmental pollution of metals has increased dramatically in the last two centuries. The presence of toxic densities of metals in the environment has detrimental effects on human and animal health and disrupts ecosystem balance and order. Therefore, it is essential to study the ways of removing these pollutants. Bioremediation, where bacteria are used to detoxify and degrade environmental pollutants, is a viable alternative to current physico-chemical strategies for the removal of heavy metals. Therefore, this study aimed to investigate the bioremediation of heavy metals from environment by bacteria was conducted. Various physical, chemical and biological methods have been used to remove heavy metals, including the use of biodegradable process because of the economically feasible method of removing many of the heavy metals using a series of low value materials. Biosorbent is the physical and chemical uptake of heavy metals by living and non-living microorganisms (bacteria, fungi, algae) and other organisms (such as rice bran, fruit bark, leaves and trees, etc.). Biosorption is a new technology that utilizes inactive or dead biomass to remove heavy metals from aqueous solution. The use of bacteria by bioremediation processes for the treatment of wastewater containing heavy metals does not have many of the major limitations of other physico-chemical methods and is more economically desirable. However, further studies are needed to address the current limitations of this technology for use on a practical scale.

**Keywords:** bioremediation, heavy metals, bacteria, biosorbent

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## **VARIATION OF PHYSICAL AND CHEMICAL PARAMETERS OF POLLUTED WATERS OF MIRASH LANDFILL IN KOSOVO**

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### **ABSTRACT**

Climate changes are the result of pollution that is caused in the air, water and land. The growth of the production of huge amounts of waste is evident and problematic. Their collection, landfilling, processing and recycling has remained a particular challenge. The bad treatment of waste in the sanitary landfill of Mirash is an additional challenge and a possibility for causing pollution in the surrounding spaces and beyond. The aim of this paper is to show the state of drainage waters based on physical and chemical parameters of polluted waters in the sanitary landfill of Mirash and to conclude whether the results exceed the allowed parameters and to compare the results for different time periods. Initially, the sample location was determined, where samples for analysis were taken and they were analyzed in a laboratory. Samples were taken in 10 different time periods in a period of 3 years. The analyzed parameters have shown different values. The results were compared to AI no. 30/2014, on limit values of wastewater discharge in the water body (Republic of Kosovo) and the standard for the assessment of the ecological status of surface water in Romania, 2006 (GD 161).

**Keywords:** Mirash landfill, polluted waters, waste, physical-chemical parameters.

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## **STRUCTURAL-DYNAMIC ORGANIZATION OF FORESTS UNDER DIFFERENT PHYSICAL-GEOGRAPHIC CONDITIONS IN PRE-BAIKAL (*East Siberia*)**

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### **ABSTRACT**

Revealing of structural-dynamic organization of forests under different physical-geographic conditions, of their formation peculiarities allows to forecast the vector of probable development of forest ecosystems on vast territories. Studies of forests at regional-topological level of environmental organization promotes establishment of trends of forests genesis on the background of climate changes modern vector. Due to this fact, the monitoring of forests reconstitution dynamics will allow to get express information on formation of forests coenoses in time and space. Such forests provide in many aspects the stability and the sustainability in forests ecosystems functioning of any hierarchy in different areas of Pre-Baikal and of the whole Baikal Region.

**Keywords:** forests, structural-dynamic organization, physical-geographic conditions, Pre-Baikal.

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## **INVESTIGATION OF DYE REMOVAL PERFORMANCE USING FUNGUS FROM SYNTHETIC WASTEWATER CONTAINING MALACHITE GREEN**

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### **ABSTRACT**

Mushrooms carry out important tasks within ecosystems. They have very important ecological tasks that other organisms cannot do. They help materials that cannot be broken down by many organisms to blend into nature and participate in the environmental cycle. Mushrooms can attract some inorganic and organic structures due to their ability to accumulate. In this research, the success of pollutant removal, such as dye and heavy metal removal, of colored wastewater prepared with the dye named Malachite Green (C.I Basic Green 4) was investigated. The fungi types used in the study are as follows; *Pleurotus ostreatus* (Jacq.) P. Kumm., *Fomes fomentarius* (L.) Fr., *Agaricus bisporus* (J.E. Lange) Imbach, *Russula Delica* Fr., *Armillaria mellea* (Vahl) P. Kumm. Colored synthetic wastewater with an initial concentration of 48 mg/L was used. As a result of experimental research, approximately 80% of dye removal was achieved under optimum conditions.

**Keywords:** Malachite Green, Adsorption, Mushrooms, Dye, Removal

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## **SENSITIVITY OF CASE DEFINITIONS IN SYNDROMIC SURVEILLANCE**

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### **ABSTRACT**

Syndromic surveillance is a primary health care-facility and emergency room (ER)-based syndromic surveillance system aiming at detecting outbreaks and undertaking public health actions. It is based on weekly notifications of nine syndromes by over 1,600 General Practitioners (GPs) in the 36 districts of Albania. Data is aggregated by district epidemiologists (DE) and centralized by the national Institute of Public Health. A syndrome is “a set of symptoms or conditions that occur together and suggest the presence of a certain disease or an increased chance of developing the disease.” In the context of syndromic surveillance, a syndrome is a set of non-specific pre-diagnosis medical and other information that may indicate the release of a bioterrorism agent or natural disease outbreak. Since its inception, syndromic surveillance has mainly focused on early event detection: gathering and analyzing data in advance of diagnostic case confirmation to give early warning of a possible outbreak. The system is useful for detecting and responding to natural disease outbreaks, and thus they have the potential to significantly advance and modernize the practice of public health surveillance.

**Keywords:** public health, early event detection, sensitivity

**Vol. 10 (2): 389-400 (2020)**

## **A COMPARATIVE STUDY FOR SODIUM BOROHYDRIDE DEHYDROGENATION AND ELECTROOXIDATION ON CERIUM AND COBALT CATALYSTS**

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### **ABSTRACT**

In the present study, Co/CNT and Ce/CNT catalysts are prepared via sodium borohydride ( $\text{NaBH}_4$ ) reduction method. Co/CNT and Ce/CNT catalysts are examined to the dehydrogenation and electrooxidation of  $\text{NaBH}_4$ .  $\text{NaBH}_4$  dehydrogenation activities of these Co/CNT and Ce/CNT catalysts are performed in alkaline environment. 5% Co/CNT catalyst exhibits superior hydrogen evolution compared with other catalysts. Activation energy is calculated using Arrhenius equation. Initial rate for this catalyst is found as  $1700 \text{ ml H}_2 \text{ g}^{-1} \text{ cat min}^{-1}$ . As a result of the kinetic calculations, the activation energy of the catalyst is calculated as 44,68775 kj/mol. The degree of reaction ( $n$ ) is found to be 0.5 by trial and error. In conclusion, 5% Co/CNT catalyst is a promising catalyst for hydrogen production from  $\text{NaBH}_4$ . Cyclic voltammetry (CV) analysis is utilized to examine the electrochemical activity of the catalysts for  $\text{NaBH}_4$  electrooxidation. 0.1% Co/CNT catalyst has  $0.38 \text{ mA cm}^{-2}$  ( $3181 \text{ mA mg}^{-1} \text{ Co}$ ) specific activity.

**Keywords:** Dehydrogenation, electrooxidation, Ce, Co, Sodium borohydride

**Vol. 10 (2): 401-408 (2020)**

## **PREVALENCE OF MRSA AND AGR SPECIFICITY GROUPS AMONG STAPHYLOCOCCUS AUREUS STRAINS COLONIZING HOSPITALIZED PATIENTS IN TERTIARY HOSPITAL CENTRE**

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### **ABSTRACT**

Methicillin resistant *Staphylococcus aureus* (MRSA) is a major pathogen that causes a broad range of serious diseases in humans, but the regulator of virulence factors in *S. aureus* is orchestrated by accessory gene regulator (*agr*) quorum sensing system. The objective of this study was to investigate the prevalence of the MRSA and frequency of virulence genes among clinical samples hospitalized in tertiary hospital centre in Tirana, Albania. Methods. About 452 clinical specimens were collected during three years in hospitalized patients. The min age of patients were 18 years and the max 89 years old. To detect the presence of MRSA in samples, we have used a slide latex agglutination kit for the rapid detection of PBP2 and the cefoxitin disk screen test. PCR assays were used to detect gene's content (*agr* groups) in 150 clinical samples isolates. Four reverse primers specific for amplification were used for each single *agr* group (*agrI-IV*). Results. Patients enrolled in this study were hospitalized in different wards and samples are collected from blood, urine, sputum, throat swab, wound, abscess, pus/exudates, skin and soft tissue swab, and indwelling medical devices. The prevalence of methicillin-resistant *S. aureus* (MRSA) was 33.2% (150/452) cases. Of the MRSA isolates identified in this study 36 (24%) were susceptible to antibiotics 10 (7%) demonstrated intermediate resistance and 9 (6%) were multi-drug resistant with resistance to six classes of antibiotics. *agr I* was the most isolates of our samples 45%. *agr II* resulted in 28% of samples, *agr III* in 10%, *dhe agr IV* in 19%. In our study we were not observed association for *agr* group with gender, age and wards. Conclusion. This is the first study conducted in Albania for prevalence of *agr* groups among *S. aureus* strains. The majority of *S. aureus* isolates in this study were classified as *agr* group I. The obtained results do not allow us to establish a direct relationship between the *agr* group and some of factors of *S. aureus* infection. To be more effective for infection control need to do future surveillance studies in order to understand distribution and relationship of *agr*.

**Key words:** *S. aureus*, MRSA, *agr* groups, hospitalized patients

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## **FORESTS FORMATION ON POST-AGRARIAN TERRITORIES OF TUNKA DEPRESSION (South-Western Pre-Baikal, Russia)**

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### **ABSTRACT**

The peculiarities of structural-dynamic organization of phytocoenoses at the contact of forests and extrazonal steppe are found out. The studied area is characterized by light-coniferous forests and by extrazonal (depression type) steppe cenoses forming on the valley bottom and along its boards and slopes trails of different expositions. The phytocoenoses of such habitats were used for a long period for pasturage and their considerable part was ploughed up for agriculture in the first half of last century. Nowadays they are mainly not used – these are fallows. It is noticed that during last 25-40 years, forests form steadily on the fallows and territories used before for pasturage. This is mainly due to changing environmental conditions as well as with the character of anthropogenic impact such as pasturage, ploughing up, cutting and fires during last decades. Formation of light-coniferous forests of zonal type is characteristic for the whole Tunka valley.

**Keywords:** forests formation, fallows, pastures, South-Western Pre-Baikal

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## **DIAGNOSIS OF POSTTRAUMATIC ARTERIOVENOUS FISTULA USING CT ANGIOGRAPHY: A CASE REPORT**

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### **ABSTRACT**

**Introduction:** Injuries of the extremities can result in the development of arteriovenous fistula. There is a significant variability in clinical presentation and often prove difficult to detect. **A case report:** This is a case report of a 26 years old man, who presented with a pulsatile mass on the left leg, without significant clinic and with a history of a stab wound to the left upper thigh 5 years earlier. An ultrasound scan revealed a communication between femoral artery and vein, also a sacular dilatation of the femoral artery. An Angio-CT was performed for a further diagnostic evaluation and confirmed an 6.6 cm venous varix of the left femoral vein and early opacification of the vein due to an AV fistula from the superficial left femoral artery. **Conclusion:** A CTA and an ultrasound scan should be performed when a vascular abnormality is suspected in a patient with a history of trauma in close proximity to major vessels.

**Keywords:** traumatic arteriovenous fistula, arterial injury.

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## **DYNAMICS OF FORMATION OF FOREST CENOSES ON THE FALLOWS (*Western Trans-Baikal, Buryat Republic, Russia*)**

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### **ABSTRACT**

Studies of the peculiarities of vegetation structural-dynamic organization on post-agrarian landscapes in the Western Trans-Baikal allowed to establish modern trends of reconstitution of grasses (in the steppes) coenoses and the vector of formation of forest ones (at the initial stage of development) during last decades – since lands ploughing up for agricultural plants and use of the territories for pasturage had stopped. Land use in a region with relatively dry periods during different years at elevated anthropogenic pressure results in considerable destructions of soil and vegetation cover. The studied area is situated within the most important biogeographic boundaries, within the boundaries of regions and provinces of southern boreal forests and zonal dry bunchgrass steppes of Central Asian type. Degrading of the environment under such conditions is more manifested and vegetation reconstitution here is a long process in time and space. Recently there are trends of forests reconstitution on the lands ploughed up before and in the sites used during many years for pasturage. Steppified spare stands of pine with cereals and motley grasses form, this is initial stage of forests of zonal type formation. There can be a constraint of forests formation on the fallows such as probable increase of anthropogenic impact, mainly pasturage accompanied periodically with burning (fire) on the background of climate changes determining the vector of formation of environmental conditions in the whole region.

**Key words:** forest coenoses, fallows, formation, Western Trans-Baikal.